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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,890	12/06/2001	Noriaki Sakamoto	10417-107001	3056

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EXAMINER

CHAMBLISS, ALONZO

ART UNIT PAPER NUMBER

2827

DATE MAILED: 01/24/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/010,890

Applicant(s)

SAKAMOTO ET AL.

Examiner

Alonzo Chambliss

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 December 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The change of address filed on 11/29/02 has been fully considered and made of record in Paper No. 3.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Drawings

3. Figures 11, 12, 13A-13D, and 14 should be designated by a legend such as -- Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: circuit elements 52 on page 11, line 10, mounting portions 63 on page 20, line 16, and back surface electrodes 56 on page 21, line 7. Also, the drawings are objected to because they include the following reference sign(s) not mentioned in the description: 56A, 56B, and 56B. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are

required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The following title is suggested: "METHOD OF MANUFACTURING A CIRCUIT DEVICE UTILIZING TRENCHES IN A CONDUCTIVE FOIL TO IMPROVE THE STABILITY OF THE DEVICE".

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. In claim 1, the phrase "shallower than a thickness of the conductive foil, on the conductive foil in regions except at least the conductive patterns" is vague and indefinite since it is confusing. Furthermore, once the trenches are formed in the conductive foil the conductive foil as a whole forms a conductive pattern.

9. Claim 1 recites the limitation "circuit elements" in line 11. There is insufficient antecedent basis for this limitation in the claim.

10. Claim 1 recites the limitation " respective mounting " in line 14. There is insufficient antecedent basis for this limitation in the claim.

11. In claim 1, the phrase " removing the conductive foil having thickness portions in which the isolation trenches are not provided " is vague and indefinite since the phrase is confusing.

12. In claims 1 and 14, the phrase " separating the insulating resin into respective mounting portions by dicing " is vague and indefinite since it is not clear how the resin being separated creates mounting portions. Furthermore, what is the resin a mounting portion for?

13. In claim 2, the phrase " forming connecting member that connect electrically electrodes of the circuit elements " is vague and indefinite since the phrase is confusing.

14. In claim 9, the phrase " the wire bonding is executed by using contrast between the conductive patterns and the conductive plating layer " is vague and indefinite since the phrase is confusing. Furthermore, the word "contrast " means a comparison is made between two objects or difference in objects.

15. In claims 11 and 13, the phrase " wherein the insulating resin is covered by transfer molding " is vague and indefinite since the phrase is confusing. Furthermore, how can a transfer molding process cover an insulating resin?

16. Claim 12 recites the limitation " conductive patterns " in lines 2 and 3. There is insufficient antecedent basis for this limitation in the claim.

17. Claim 12 recites the limitation " mounting portions " in line 3. There is insufficient antecedent basis for this limitation in the claim.

18. In claim 12, the phrase " the circuit elements are formed are aligned in a matrix fashion are arranged on the conductive foil " is vague and indefinite since the phrase is confusing.

19. In claims 15 and 16, the phrase " the dicing is carried out by using alignment marks formed together with the conductive patterns " is vague and indefinite since it not clear where the alignment marks are relative to the conductive patterns or the circuit elements.

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

21. Claims 1-11, insofar as definite, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin (U.S. 6,238,952) in view of Coffman (U.S. 6,451,627).

With respect to Claim 1, Lin discloses forming conductive patterns (i.e. the shape of the conductive foil after creating trenches) by preparing a conductive foil 235 and forming isolation trenches (i.e. between central bulge 235a) shallower than a thickness of the conductive foil 235. The trenches on the conductive foil 235 are in desired regions of the conductive foil 235 except for the area on which a number of mounting portions of circuit element 210 are formed (see Figs. 7-9). The surfaces of the conductive patterns are covered and the isolation trenches with a resist layer 250 and forming conductive plating layer 242, 244 in desired regions of the conductive patterns. The circuit element 210 is fixed on the conductive plating layer 242, 244 on respective mounting portion of desired conductive patterns. An insulating resin 220 (i.e. epoxy molding compound) is commonly molded to cover collectively the circuit element 210 on respective mounting portion and to fill the isolation trenches. The conductive foil 235 is removed so that a portion of the thickness in which the isolation trenches are not provided. Lin fails to explicitly disclose more than one circuit element and mounting portions, which are separated along with an insulating resin into respective devices with mounting portions by dicing. However, Coffman discloses more than one circuit elements 40 and mounting portions, which are separated along with an insulating resin 50 into respective devices with mounting portions by dicing (i.e. to cut into smaller segments) (see col. 4 lines 32-41; Figs. 5-9). Therefore, it would have been obvious to one skilled in the art at the time of the invention to incorporate the separation of the

resin into respective devices into the process of Coffman, since the separation process would accurately create multiple devices at the same time while reducing production time as taught by Coffman.

With respect to Claim 2, Lin discloses forming connecting member 212 that are electrically connected to electrodes of the circuit elements 210 on respective mounting portions and desired conductive patterns, before the step of commonly molding an insulating resin 220 (see Figs. 10 and 11).

With respect to Claim 3, Lin discloses wherein the conductive foil 235 is formed of copper (see col. 5 lines 46-50).

With respect to Claim 4, Lin discloses wherein the conductive plating layer 242, 244 is formed smaller than the conductive patterns (see Figs. 9-11).

With respect to Claim 5, Lin discloses wherein the conductive plating layer 244 is formed of gold (see col. 5 line 55-57).

With respect to Claim 6, Lin discloses wherein the isolation trenches are formed selectively on the conductive foil 235 are formed by physical etching (see col. 1 lines 42-45), since a physical etching requires a tool or etching agent for removing portion of the conductive foil.

With respect to Claim 7, Coffman discloses wherein the circuit elements are chip circuit components (see col. 3 lines 26-30).

With respect to Claim 8, Lin discloses wherein the connecting member 212 is formed by wire bonding (see Figs. 10-16).

With respect to Claim 9, Lin discloses wherein the wire bonding is applied onto the conductive plating layer 242, 244 of the conductive pattern (see Figs. 10-15).

With respect to Claim 10, Lin discloses wherein the position recognition of the wire bonding is executed on the conductive patterns and the conductive plating layer 242, 244 (see Figs. 10-15).

With respect to Claim 11, Lin discloses wherein the insulating resin 220 is applied by transfer molding (see col. 6 lines 25-28).

Allowable Subject Matter

22. Claims 12-16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest the combination of a plurality of blocks in which the conductive patterns on which at least a number of the mounting portions of the circuit elements formed are aligned in a matrix fashion on the conductive foil.

The prior art made of record and not relied upon is cited primarily to show the product of the instant invention.

Conclusion

23. Any inquiry concerning the communication or earlier communications from the

Application/Control Number: 10/010,890
Art Unit: 2827

Page 9

examiner should be directed to Alonzo Chambliss whose telephone number is (703) 306-9143. The fax phone number for this Group is (703) 308-7722 or 7724.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-7956.

AC/January 19, 2003

A handwritten signature in cursive script that reads "Alonzo Chambliss".

Alonzo Chambliss
Patent Examiner
Art Unit 2827